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MULTIPLE GLASS SHEET GLAZING UNIT

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5 Claims. (Cl. 20—56.5)

The invention relates to multiple pane window constructions and more particularly to an improved means for holding a pair of glass sheets in sealed and spaced relation to each other.

As is well known to those versed in the art, a great many multiple pane glazing units have been proposed which have had many deficiencies that the present invention overcomes.

One of the disadvantages of the prior devices was the inability to eliminate the ingress of moisture and to remove moisture economically. Another disadvantage resided in the fact that the binding frames for the glass were bulky and cumbersome, increasing the difficulty of installation. The bulk was materially increased when more than two sheets of glass were secured in position.

Furthermore the prior constructions were very difficult and expensive to manufacture making the cost so high as to militate against their use by many consumers.

By the present invention I am able to make a multiple pane window construction much cheaper than was heretofore thought possible. In addition I am able to provide one where the frame is narrow at the edges of the glass and is therefore not unsightly as in prior devices. The thickness of the frame is such that the glazing operation is very simple. Furthermore, the width of the frame is such that the glazing operation, when used in a window sash, normally conceals the frame and does not detract from the appearance of the installation.

By my improved construction I am able to easily eliminate the moisture ordinarily between the glass sheets and to provide means that is cheap and economical for assuring that the space between the sheets will remain free of moisture.

Still other advantages of the invention and the invention itself will become more apparent from the following description of some embodiments thereof which are illustrated in the accompanying drawings and forms a part of this specification.

In the drawings:

FIG. 1 is an enlarged fragmentary perspective view of the window of my invention illustrating the manner of assembly of the frame with a pair of glass sheets;

FIG. 2 is an enlarged fragmentary top edge view of the assembly;

FIG. 3 is a diagrammatic view showing the corner of the window assembly during one stage of its construction;

FIG. 4 is an enlarged fragmentary vertical section illustrating a modified form of frame section;

FIG. 5 is an enlarged fragmentary vertical section of another form of frame section; and

FIG. 6 is an enlarged view showing my invention applied to a triple sheet pane.

Briefly, the invention contemplates a frame having a separator portion for holding the sheets of glass in spaced relation to each other, the separator portion being flanked by edge flanges which may engage with the edges of the glass. The separator portion also acts as a container, which opens to the space between the glass sheets, for holding a desiccant. The use of a desiccant, although not imperative, eliminates the effect of any residual moisture that is not normally eliminated during the assembly process.

More particularly a greater economy is realized because each side frame, the ends of which are mitered

to make a complete frame, may be made of a single strip of metal.

As best shown in FIG. 1, the frame comprises a flat base portion 10, the opposite edges of which are bent back upon themselves as at 11, to provide glass supporting flanges. These flanges may vary in width and be of the same width or ordinarily wider than the thickness of the glass. The inwardly bent portions of the flange merge with a pair of downwardly extending inwardly bowed portions 12 the upper portion 13 of which comes into close proximity to the inner corner edges of the glass sheet and the lower portion 14 of which preferably has an edge contact with the glass. Although the parts 13 and 14 may, in some instances, contact with the glass it is preferred that, as will later appear, a sealing and holding compound 24 will be disposed between the flange 11 and part 13 and the glass. At the lower extremities of the bowed portion, the strip is provided with a pair of inwardly extending flanges 15, that extend toward each other but terminate in closely spaced relation to provide a slight gap 16. This gap should be relatively small but at the same time be sufficiently large that a circulation of air into the hollow part or chamber 17 may be realized in order that a desiccant, such as silica gel, disposed in the chamber 17, be effective to get rid of any residual moisture remaining after the assembly process.

The upper surface of the base 10 is provided with one or more inwardly extending depressions 20, disposed in spaced relation along the surfaces. The number and form of the depressions may vary, the purpose being to enable one of them, preferably when in the mid portion, to be drilled, as indicated at 21, to permit the egress of air during the assembly operation and subsequently to be soldered shut to seal the chamber off. The depressed formation assures that the solder may effect a seal and still not project above the surrounding surface beyond the depression and provide irregularities that would interfere with the mounting of the frame in a sash.

The space between the concave walls 12 of the separator and the glass is filled with a material which will cause the parts to adhere to each other and prevent the ingress of moisture, such as material may be a suitable thermo-setting compound 24 which will adhere to the glass as well as to the surface of the separator and provide an effective seal. Preferably the compound also extends around the corner 13 and under the flange 11, thus slightly separating the glass from the metal strip and providing an effective glass to metal hermetic seal against the ingress of air or moisture.

The strip described may be made by extrusion or by roll forming and the metal can be steel plated with a non-corrosive material such as tin, zinc., etc., stainless steel, ordinary steel, copper or aluminum. In some instances, it may be desirable to make the metal of an alloy having the same co-efficient of expansion as the glass sheets. The frames illustrated in the drawings are approximately four to six times the normal size.

Preferably the frames and glass are assembled in the following manner. The frames are cut to provide a mitered corner joint, which in the case of a rectangular frame would be 45°. At least one hole 21 is drilled in one of the depressions, usually midway between the ends of the frame. A small quantity of silica gel is placed in each section of frame and then fusible plugs 30 of solder, FIG. 3, are inserted in each end adjacent the miter. The plugs hold the silica gel in the chamber. The sections of frame are then assembled and supported in a suitable jig, of which two members are illustrated diagrammatically at J. The corners are then dipped in a suitable solder flux. The jig is then lowered over a solder pot, or a solder pot raised under the frame as indicated diagrammatically

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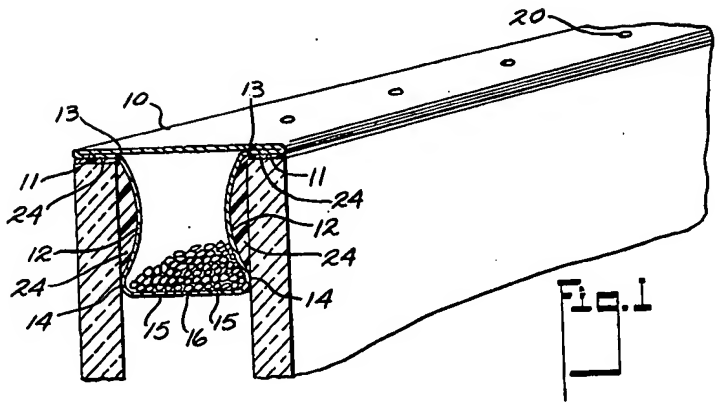

Fig. 1

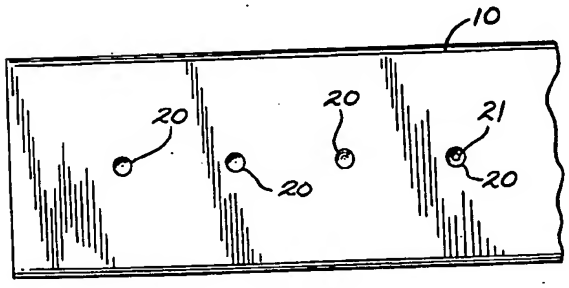

Fig. 2

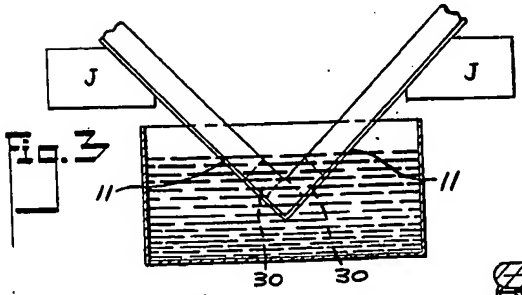

Fig. 3

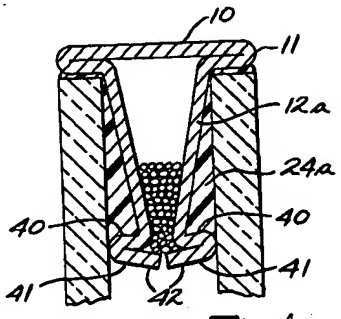

Fig. 4

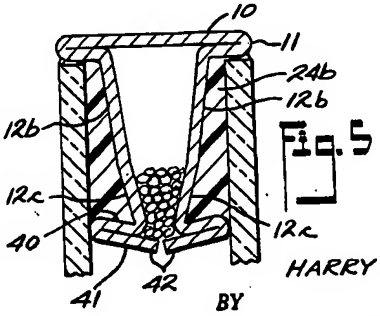

Fig. 5

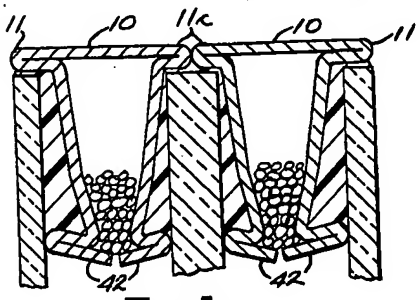

Fig. 6

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